

WHAT IS CLAIMED IS:

1. A gatekeeper in an Internet Protocol (IP) telephony system, comprising:

a conference managing unit configured to process a multimedia communication control message, perform third-party pause and rerouting (3PPR) signaling, and perform a handoff and call transfer signaling for a mobile terminal;

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a registration, admission and status (RAS) managing unit configured to process a RAS message, interface with a network layer, and communicate with the conference managing unit while processing a care of address (COA) registration for the handoff of the mobile terminal;

a RAS message processor configured to encode and decode the RAS message;

a call managing unit configured to processes a call signal message;

a H.225 call signal processor configured to carry the call signal message on a corresponding carrier and encode and decode the call signal message;

a H.245 control message processor configured to encode and decode messages of the call managing unit and conference managing unit in accordance with the

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PER;

a supplementary service managing unit configured to call the conference managing unit while processing a message for a supplementary service;

a call set-up information node configured to store information obtained when the call signal message is processed;

a conference information node configured to store control information obtained when the multimedia communication control message is processed;

a supplementary service information node configured to store information obtained when the message for the supplementary service is processed; and

a user information buffer configured to store user information managed by the RAS managing unit.

2. The gatekeeper of claim 1, wherein the conference managing unit further comprises a message buffer configured to buffer a plurality of messages while opening a multimedia communication control channel to support a tunneling function.

3. The gatekeeper of claim 2, wherein conference managing unit is configured to pause a transmission of signals to the mobile terminal during the handoff and transfer, and store the plurality of messages in the buffer during the pause.

4. The gatekeeper of claim 3, wherein conference managing unit is configured to re-initiate the transmission of signals to the terminal upon completion of the handoff and transfer, and transmit the plurality of messages stored in the buffer upon re-initiation.

5. The gatekeeper of claim 1, wherein the H.225 call signal processor further comprises:

a Q.931 carrier configured to carry the call signal message received from the call managing unit on the carrier of a Q.931 format;

5 a Q.932 carrier configured to carry the received call signal message on the carrier of a Q.932 format;

a Q.850 carrier configured to carry the received call signal message on the carrier of a Q.850 format; and

10 a PER encoder/decoder configured to encode the call signal message carried on the corresponding carrier according to the PER and decode a call signal packet received by the gatekeeper in accordance with the PER.

6. The gatekeeper of claim 1, wherein the H.245 control message processor further comprises a PER encoder/decoder configured to encode a message received from the call managing unit and the conference managing unit in accordance with the PER and output the encoded message from the gatekeeper, and wherein the PER encoder/decoder
5 decodes a packet received by the gatekeeper in accordance with the PER.

7. The gatekeeper of claim 1, wherein the RAS message processor further comprises a PER encoder/decoder configured to encode the RAS message received from

the RAS managing unit in accordance with the PER, and output the encoded message from the gatekeeper, and to decode a RAS packet received by the gatekeeper in accordance with the PER.

8. The gatekeeper of claim 1, wherein the conference managing unit resets a media channel when called, without discriminating whether the call is caused by movement of the mobile terminal or caused to support the supplementary service.

9. The gatekeeper of claim 1, wherein when called, the conference managing unit pauses signals to the mobile terminal by performing the 3PPR signaling, calls the call managing unit when the mobile terminal is paused, and requests the call managing unit to update the call set-up information node in accordance with related information from the conference information node, to perform one of a call transfer and the handoff.

10. An intra-zone handoff method in an Internet Protocol (IP) telephony system, comprising:

determining whether an established call between an origination terminal and a destination terminal is a general call or a fast connect call;

opening a H.245 control channel with the origination terminal and the destination terminal if it is determined that the established call is a fast connect call;

suspending the destination terminal so as to perform a handoff when the origination terminal moves to a different subnet of the same zone and requests a registration using a newly allocated care of address (COA);

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performing Q.931 signaling with the moved origination terminal and transmitting a terminal capability set message received from the moved origination terminal to the suspended destination terminal to re-initiate the destination terminal; and

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performing master slave determination signaling and logic channel establishment signaling between the moved origination terminal and the destination terminal and re-routing a data packet received from the destination terminal to the moved origination terminal.

11. The method of claim 10, wherein a gateway determines whether a general call is established.

12. The method of claim 10, wherein the data packet is a real-time transport protocol (RTP) packet.

13. The method of claim 10, wherein opening the H.245 control channel comprises:

setting up a H.245 TCP connection between the origination terminal and the destination terminal;

- 5 performing a H.245 capability set exchange signaling; and
performing an initial H.245 master slave determination signaling.

14. The method of claim 10, wherein the gatekeeper performs a message buffering function in opening the H.245 control channel to support a tunneling function.

15. The method of claim 10, wherein if it is determined that the call is the fast connect call, a control state of a H.245 signaling is changed to a CapabilitySetAck Received (Qoa) state without going through a Start (Qs) State, transitioned from the Qoa state to the Qs state according to a H.245 TCP connection induction, transitioned from the Qs state to a CapabilitySet Received (Qcr) State upon receipt of a Capability Set message, transitioned from the Qcr state to a MasterSlaveDetermination Received (Qmr) State upon receipt of a master slave determination message, and transitioned to the Qoa state according to receipt of logical channel information of the fast connect so that third-party pause and rerouting (3PPR) signaling can be performed.

16. The method of claim 10, wherein rerouting the data packet to the moved origination terminal comprises:

substituting IP fields of every message sent by the moved origination terminal to the gatekeeper with COAs allocated by a foreign agent (FA); and

5 changing a destination address of an IP header of a received message from the COA to an IP address of the moved origination terminal when a signaling message transmitted from the gatekeeper and the data packet transmitted from the destination terminal are received by the FA.

17. The method of claim 10, wherein if it is determined that the general call is established between the origination terminal and the destination terminal, the gatekeeper performs a third party initiated pause and rerouting signaling for the intra-zone handoff using the H.245 control channel.

18. An intra-zone handoff method, comprising:
pausing a destination terminal to perform an intra-zone handoff when an origination terminal that has moved to another subnet of a same zone requests a registration using a newly allocated care of address (COA);

5 performing Q.931 signaling with the origination terminal and transmitting a terminal capability set message received from the origination terminal to the paused destination terminal to re-initiate the destination terminal; and

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performing H.245 control signaling between the origination terminal and the destination terminal and re-routing a real-time transmission protocol (RTP) packet from the destination terminal to the origination terminal.

19. An inter-zone handoff method for a fast connect call, comprising:

opening a H.245 control channel between an origination terminal and a destination terminal;

informing a home gatekeeper (HGK) by a foreign gatekeeper (FGK) of inter-zone roaming of the origination terminal when the origination terminal moves into a subnet of a different zone and requests a registration from the FGK, using a newly allocated care of address (COA);

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registering the moved origination terminal and instructing a suspension of the destination terminal when the inter-zone roaming of the origination terminal is sensed by the HGK;

performing direct signaling between the moved origination terminal and the FGK when a set-up message is transmitted to the moved origination terminal, and opening a Q.931 channel directly by the moved origination terminal and the HGK without passing through the FGK;

15 receiving a terminal capability set message from the moved origination
terminal and transmitting the received terminal capability set message to the destination
terminal to re-initiate the suspended destination terminal;

performing H.245 control signaling with the moved origination terminal
and the destination terminal and rerouting a RTP packet received from the destination
20 terminal to the moved origination terminal.

20. The method of claim 19, further comprising determining whether a call is
a general call or a fast connect call when the call is established between the origination
terminal and the destination terminal.

21. The method of claim 19, wherein opening the H.245 control channel
comprises:

setting up a H.245 TCP connection between the origination terminal and
the destination terminal;

5 performing a H.245 capability set exchange signaling; and
performing a H.245 master slave determination signaling.

22. The method of claim 19, wherein the HGK performs a message buffering
function when the H.245 control channel is opened to support a tunneling function.

23. The method of claim 19, wherein when the call is established, a control state of a H.245 signaling is changed to a CapabilitySetAck Received (Qoa) state without going through a Start (Qs) State, transitioned from the Qoa state to the Qs state according to a H.245 TCP connection induction, transitioned from the Qs state to a CapabilitySet Received (Qcr) State upon receipt of a Capability Set message, transitioned from the Qcr state to a MasterSlaveDetermination Received (Qmr) State upon receipt of a master slave determination message, and transitioned to the Qoa state according to receipt of logical channel information of the fast connect so that third-party pause and rerouting (3PPR) signaling can be performed.

24. An inter-zone handoff method, comprising:
informing a home gatekeeper (HGK) by a foreign gatekeeper (FGK) of inter-zone roaming of an origination terminal when the origination terminal moves into a subnet of a different zone and requests a registration from the FGK, using a newly allocated care of address (COA);

admitting the registration of the moved origination terminal and pausing a destination terminal when the HGK recognizes the inter-zone roaming of the origination terminal;

performing direct signaling between the moved origination terminal and the
10 FGK when a set-up message is transmitted from the HGK to the moved origination
terminal;

opening a Q.931 channel directly between the moved origination terminal
and the HGK without the FGK;

receiving a terminal capability set message from the moved origination
15 terminal and transmitting the received terminal capability set message to the destination
terminal to re-initiate the paused destination terminal; and

performing H.245 control signaling between the moved origination terminal
and the destination terminal and re-routing a real-time transmission protocol (RTP)
packet received from the destination terminal to the moved origination terminal.

25. An intra-zone handoff method, comprising:

updating routing information of a first routing cache when a packet is
received from a mobile terminal that has moved from a first subnet to a second subnet,
and transmitting the packet from a cellular IP base station to a cellular IP router;

5 updating routing information of a second routing cache when the packet is
received from the cellular IP base station and routing the received packet from the cellular
IP router to a cellular IP gateway; and

updating routing information of a third routing cache when the packet is received from the cellular IP router and routing the received packet to another party terminal, according to the routing information stored in the third routing cache.

26. The method of claim 25, wherein an IP address of a H.323 terminal and an interface to the H.323 terminal are stored as a pair in the first, second, and third routing caches.

27. The method of claim 25, wherein the respective routing information stored in each routing cache is deleted when a prescribed period of time elapses, and wherein the mobile terminal periodically transmits a control packet so that routing information of each routing cache can be refreshed when the mobile terminal has no other data packets to be transmitted.